

REMARKS

Claims 1-8 are pending in the application. Claim 1 has been amended by the present amendment. The amendment is fully supported by the application as originally filed (see, e.g., specification at page 10, lines 4-16; and page 11, lines 21-23).

As amended, independent claim 1 recites a multi-chip package device in which a heat sink includes at least one hollow part adjusted in size depending on the thickness of the heat sink to effectively release thermal stresses from the heat sink (see specification at page 10, lines 4-16; and page 11, lines 21-23).

For example, as shown in FIG. 4b of the application, the heat sink 34 includes hollow parts 34a that are sized to "effectively release thermal stresses from the heat sink 34 where the first chip 32 is attached" (see specification at page 10, lines 6-12). In other words, the size of the hollow parts 34a is "flexibly adjusted" to achieve effective stress release (see specification at page 11, lines 21-23).

According to the Applicant's claimed invention, thermal stresses generated by the heat sink can be released via the hollow parts, which can eliminate delamination of the heat sink from the chip or semiconductor package, chip cracking, structural warpage, and deterioration of electrical connections (see, e.g., specification at page 10, line 17 to page 11, line 4).

Claims 1-4 and 6-8 were rejected under 35 USC 103(a) as being unpatentable over U.S. Patent Application Publication US 2004/0099945 to Ku (hereinafter "Ku"). Claim 5 was rejected under 35 USC 103(a) as being unpatentable over Ku in view of U.S. Patent 5,598,033 to Behlen et al. These rejections are respectfully traversed.

The Ku reference does not teach or suggest a multi-chip package device in which a heat sink includes at least one hollow part adjusted in size depending on the thickness of the heat sink to effectively release thermal stresses from the heat sink, as recited in independent claim 1.

On page 3 of the Office Action of 05/30/2007, an aperture 504 of a thermal bridge 50 was cited as allegedly corresponding to the Applicant's claimed "at least one hollow part."

In Ku, the aperture 504 is used "to accommodate the chips for saving material and facilitating the flow path design in forming the encapsulant 20 on the substrate 10" (see paragraph 0050 of Ku).

However, there is no teaching or suggestion in Ku that the aperture 504 can somehow be adjusted in size to "effectively release the thermal stresses from the heat sink" as claimed. In Ku, the aperture 504 is provided merely to save material and facilitate flow design.

For at least the reasons discussed above, the Ku reference does not anticipate or otherwise render obvious the Applicant's claimed invention. Therefore, independent claim 1 and dependent claims 2-8 are patentable over Ku.

Regarding the rejection of claim 6 over Ku, on page 4 of the Office Action of 05/30/2007, it was alleged that the chips 30 or 31 of Ku are mounted at the "center" of the substrate 10 in Ku. However, as shown in FIG. 4 of Ku, the chips 30 and 31 clearly are not mounted at the center of the substrate 10.

Moreover, reference number 10 of Ku was cited as allegedly corresponding to both a "semiconductor package" and a "chip carrier." However, claim 6 requires that the semiconductor package is mounted at a position on the chip carrier corresponding to a corner of the heat sink. To satisfy the claimed mounting arrangement, the substrate 10 of Ku cannot be considered both a semiconductor package and a chip carrier, i.e., the substrate 10 of Ku is not mounted on itself. Further, the encapsulant 20 of Ku cannot be considered a "semiconductor package" because it merely covers and seals the chips (see, e.g., paragraph 0048 of Ku), and thus does not correspond to a "semiconductor package."

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

Respectfully submitted,

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